

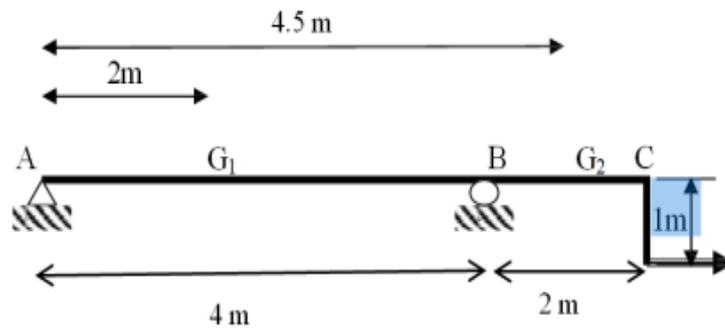
Series 1: Internal Force Resultant (Cohesion Torsor)

Exercise 1

A beam simply supported at B and pinned at A is subjected to a force F at point D.

1. Calculate the support reactions.
2. Calculate the internal force resultant (cohesion torsor) at cross-sections G1 and G2.

Given: $F = 5000 \text{ N}$

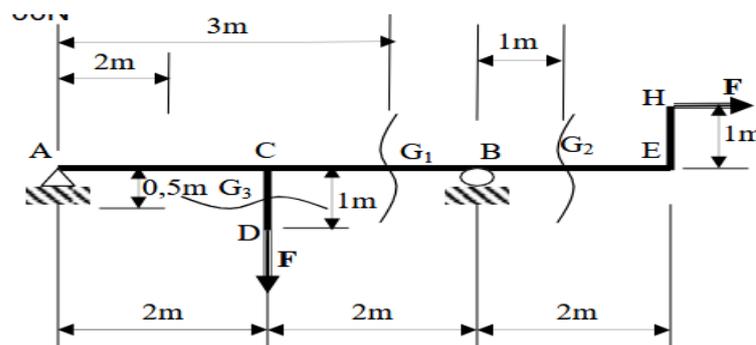


Exercise 2

A beam simply supported at B and pinned at A is subjected to the force F at points D and H.

1. Calculate the support reactions.
2. Calculate the internal force resultant (cohesion torsor) at cross-sections G1, G2, and G3.
3. Deduce the type of loading at these sections.

Given: $F = 5000 \text{ N}$,



Exercise 3

A reinforced concrete beam is fixed (built-in) at A, supports its own weight, and is subjected to two forces F1 and F2 at point B.

1. Calculate the value of the uniformly distributed load q per linear meter due to self-weight.
2. Calculate the support reactions.
3. Express, as a function of x , the internal force resultant (cohesion torsor) at section G.
4. Draw the diagrams of the non-zero components of the internal force resultant along the beam.

Given:

$$F1 = 3000 \text{ N}, F2 = 2500 \text{ N}$$

$$\text{Unit weight of reinforced concrete} = 25,000 \text{ N/m}^3$$

$$\text{Beam cross-section} = 30 \times 20 \text{ cm}$$

